

Guidance on Issuing Permits to
Facilities Required to Analyze
Groundwater for Appendix 8 Constituents

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Guidance on Issuing Permits to Facilities
Required to Analyze Ground Water for
Appendix VIII Constituents

EPA's regulations for the issuance of permits to land-based hazardous waste facilities require some owners and operators to analyze ground water for each of the approximately 375 hazardous constituents listed in Appendix VIII to 40 CFR Part 261. Experience has shown the Agency that it is not possible to analyze for all of these constituents in a timely manner. For some constituents, analysis is impossible under any time frame. This document presents EPA's latest views on the analytical potential of each Appendix VIII constituent and explains how permit writers may exercise discretion under the existing regulations to expedite permit issuance where Appendix VIII analyses are required.

Background

EPA promulgated Appendix VIII in 1980 to identify a broad range of chemicals that should be considered for regulation under the RCRA hazardous waste program. EPA used the list primarily to identify substances that should be listed as hazardous wastes. In 1982, however, EPA adopted the same list as an important element in its ground-water protection program for land-based hazardous waste facilities. Under some circumstances the new regulations required owners and operators to analyze ground water at their facilities for the presence of each constituent on the list. Some owners and operators were required to submit such analyses as part of their permit applications.

At the time of promulgation EPA acknowledged that it lacked analytical methods for nine of the Appendix VIII constituents. 47 Fed. Reg. 32296 (July 26, 1982). As owners and operators of hazardous waste facilities tried to implement these requirements, however, EPA learned that analysis would be extremely difficult or impossible for a larger number of constituents. Specific problems are described in more detail in the technical discussion that follows this introduction.

EPA took several actions intended to mitigate the problems. For example, EPA wrote a series of memoranda identifying some of the more intractable analytical problems and recommending the use of enforcement discretion. See, for example, the August 16, 1984 memorandum from Courtney Price and Lee Thomas on "Enforcing Ground-Water Monitoring Requirements in RCRA Part B Permit Applications". Also, in 1984 EPA proposed to eliminate 22 Appendix VIII constituents from the ground-water analysis requirements. 49 Fed. Reg. 38786 (October 1, 1984).

Enactment of the 1984 RCRA amendments further sharpened this issue. New provisions in Section 3005(c) require EPA to take final action on all permits for all land disposal facilities by November 1988. If EPA insists that all facilities required to submit Appendix VIII analyses must test for each Appendix VIII constituent, EPA will almost certainly miss this deadline. Hence, in some cases the permit application rules might conflict with the statutory deadline. While EPA might miss the deadline for some facilities for other reasons, requiring Appendix VIII analyses for as many constituents as conceptually possible would certainly exacerbate the problem.

EPA is planning to propose to modify the Appendix VIII monitoring requirements as quickly as possible. In the first of two separate rulemakings it will address the analytical problems described in this guidance. Regulatory revisions, however, will take a number of additional months to complete.

To respond to this dilemma, EPA has prepared new guidance on meeting the requirements for permit applications. Experts from EPA and State offices met in December 1985 to consider anew the feasibility of analyzing for each constituent on the Appendix VIII list. On the basis of subsequent analytical experience, they concluded that the earlier relief efforts did not go far enough. Where analysis is impossible or so time-consuming that it conflicts with other requirements, the permitting regulations contain sufficient flexibility to allow permit writers to waive analyses for Appendix VIII constituents. The experts at the meeting believe that some of the chemicals listed in the guidance would be present at any site contaminated by any Appendix VIII constituent. Thus, no plume of contamination should escape identification and control, and there will be no loss of environmental protection. Permit writers, however, should also write permit conditions that will "reopen" the waivers after EPA completes the first stage of its Appendix VIII rulemaking. EPA has also concluded that owners and operators should be analyzing for several other important industrial chemicals that do not appear on the Appendix VIII list. The new "omnibus" condition authority will allow the Agency to write conditions requiring analysis for these additional substances.

The remaining sections of this document present the results of these efforts. The next section describes in more detail the technical problems the experts identified and the solutions they recommended. The final section presents the regulatory basis for exercising discretion. Three lists of hazardous constituents are attached. The first list describes

hazardous constituents from Appendix VIII that the group of experts considered generally suitable for ground water analysis at all facilities. The second lists the additional chemicals that should be analyzed at all facilities. The third contains all constituents on Appendix VIII and identifies for specific constituents the technical problems which make ground-water analysis difficult or impossible.

This document is only a guide to the exercise of discretion under the permit application regulations. It does not constrain discretion or require permit writers to follow its recommendations either generally or in any particular case. EPA intends it to provide interim relief to expedite permit issuance while the Agency pursues regulatory changes to the requirements for analyzing ground water for Appendix VIII constituents.

This guidance addresses Appendix VIII only in the context of ground-water monitoring. It does not call into question the appropriateness of using Appendix VIII for other purposes, such as listing hazardous wastes or conducting corrective action for releases to any other environmental medium.

A. Technical Problems and Recommended Solutions

Analyzing ground water for all Appendix VIII constituents is impossible for several reasons. Appendix VIII is ill-defined; some listings are ambiguous and others are indefinitely large classes of compounds. When placed in water some Appendix VIII constituents separate into ions which must be measured as such, while others actually react with water and decompose. Many Appendix VIII constituents are so rare that analytical standards are unavailable. While experience with analysis of many constituents is sparse, preliminary results indicate that many constituents are not measured adequately or even detected at all by EPA's standard analytical methods.

As a result, the regulated community has been forced to guess as to how to try to fulfill the regulations and analytical labs have been forced to provide data they suspect are unreliable. Permit writers have received a number of different analytical schemes purporting to meet the Appendix VIII requirement, but none of these represented a complete analysis for all constituents listed on Appendix VIII.

In December 1985 EPA convened a four-day meeting with experts from EPA Headquarters, EPA Regional Offices, EPA Laboratories and State Offices. Appendix VIII was considered in light of the above problems and a revised list was compiled. This list represents EPA's current guidance as to what analysis of Appendix VIII constituents is feasible to do routinely. Hard data were lacking in several instances and decisions on the list required professional judgment.

Ambiguous listings and categories

Ambiguous listings on Appendix VIII have been clarified with the addition of systematic names which specify the exact chemical structure. These names generally utilize the nomenclature of the ninth Collective Index of Chemical Abstracts, and are generally known as "9CI" names. Chemical Abstracts Service Registry Numbers were added.

Each of the categories of compounds was carefully examined. In most cases some or all members of the category were already listed separately on Appendix VIII, and those separate listings were chosen to represent the category. In other cases it was possible to identify a single analyte, generally a metal, which adequately represented the category. In several instances the group decided to list as representatives chemicals which EPA earlier had identified as priority pollutants under the Clean Water Act or listed for ground-water analysis under Superfund. The group felt that such chemicals would make appropriate representatives of Appendix VIII categories because EPA has found that chemicals on these lists generally pose significant environmental threats. The priority pollutant list, for example, was based on production volumes and environmental risks. In a few cases the group found no members of a category listed separately on Appendix VIII or on the other two lists. To avoid leaving these categories unrepresented, the group selected a common commercial chemical as a representative.

Removing these ambiguities should expedite compliance with analytical requirements because it will reduce the need to negotiate the meaning of these terms for each Appendix VIII analysis. Designating representatives for categories will save time by significantly reducing the number of chemicals each analysis must address.

Constituents unstable in water

Since ionic compounds dissociate in water, Appendix VIII analyses must focus on the inorganic anions and cations that are significant in ground water. Action is based on total levels of, for example, cadmium or cyanide, without regard for what compound was their source. Appendix VIII ionic constituents have, therefore, been replaced by listings of individual ions or elements. Constituents which decompose in water within approximately two days have been excluded from the revised list.

Organometallic constituents

Organometallic compounds presented a special problem. In theory one could test for the presence of the compound by

testing for the metal. However, this does not measure the amount of the organometallic compound and the listing on Appendix VIII was based on the particular hazards of the compound, not the metal. EPA's standard test methods do not produce acceptable data for organometallic compounds. Therefore, the guidance places the organometallic compounds into the group with no analytical methods. Since the metals in question are all listed on the guidance for other reasons, there is no loss of coverage for them.

Unavailable standards

Constituents without commercially available standards have also been excluded. It is possible to analyze for such constituents using similar chemicals as surrogate standards, but such data are inherently less reliable. Moreover, such procedures require special expertise. Competition for the limited capacity in laboratories qualified to perform such analyses may delay permit issuance. For the purpose of this guidance, "unavailability" means that no one will sell reasonably pure samples of a chemical to analytical laboratories. While this decision was based on the difficulty of producing reliable analytical data without standards, EPA believes there will be serendipitous environmental benefits. The absence of commercially available standards means there is no market for the pure chemical. Also, most of the chemicals in this group are so complex as to be unlikely to be accidental byproducts. Consequently, the chemical is unlikely to be sent to hazardous waste facilities for disposal. Were EPA to require widespread analysis of such a chemical, it might create an incentive for a specialty chemical manufacturer to start production of the chemical for laboratory use -- clearly an undesirable result.

Lack of standardized test methods

EPA's standard methods for analysis of large groups of compounds are atomic absorption (AA) or inductively coupled plasma (ICP) for metals, gas chromatography/mass spectroscopy (GC/MS) for most organics, and gas chromatography (GC) for high sensitivity pesticide analyses. For some Appendix VIII constituents which are not amenable to these methods, high performance liquid chromatography (HPLC) has been proposed. Single-column HPLC, however, does not positively identify compounds and, therefore, is inappropriate for complex samples containing unknown constituents. These are precisely the conditions which apply when the regulations call for Appendix VIII analyses. This problem limits the usefulness of HPLC in this situation. EPA is actively pursuing research into using multiple column HPLC systems or coupling HPLC with mass

spectroscopy to address this problem. Until this is accomplished, HPLC analysis of complex ground water samples containing unknown chemicals is not feasible.

Some constituents which EPA preliminarily identified as analyzable by EPA's GC/MS methods have proven not to yield reliable results, so the group recommended exclusion of these constituents from the short term guidance. EPA is pursuing research into improved GC/MS methods to address this problem. However, the group decided not to exclude a number of compounds of limited volatility that do not respond to a conventional GC/MS analysis using conventional purge and trap sample preparation. The group decided to recommend these compounds for routine analysis because they can be detected by using a heated purge and trap method to prepare for GC/MS. Heated purge and trap occurs in conjunction with GC in the RCRA methods and in conjunction with GC/MS in other EPA methods. EPA will identify these compounds in a separate document that it plans to prepare in the very near future.

As a theoretical matter, it might be possible to develop reasonably accurate methods to analyze ground water for all or nearly all of the constituents listed in Appendix VIII that lack standardized test methods. EPA, however, is not certain that an acceptable method could be developed for each constituent. Developing such methods, moreover, would be extremely time-consuming. An analyst essentially would have to experiment with each constituent until he developed a technique that would provide data. Obtaining reasonably accurate data for each of the constituents lacking test methods could take months.

Furthermore, such experiments would be largely site-specific. Different waste matrices and different ground-water chemistry would affect the result of the analysis. Since these parameters vary widely at hazardous waste facilities, methods acceptable for one facility would not necessarily work at other facilities. Also, relatively few laboratories are capable of performing such sophisticated analyses. Consequently, if each of the owners or operators of facilities requesting RCRA permits tried to conduct full Appendix VIII analyses, it could take years to complete all the permit applications. In addition, such data are generally less reliable than data generated by standardized methods. Consequently, EPA believes permit writers should exercise discretion in calling for analyses of constituents in this category.

In summary, the first list attached at the end of this document represents EPA's current opinion as to which Appendix VIII constituents can be routinely analyzed in ground water at

most facilities at the present time. It has been derived by examining the present Appendix VIII in the light of a number of known analytical problems. It should be noted that cost, mobility in ground water, the nature of the wastes at particular sites, and other similar factors were not considered in this process.

Adding Chemicals from the Superfund List

The group also recommended that owners and operators should generally analyze for an additional list of 25 hazardous substances that appear on the Superfund program's "Hazardous Substances List," but do not appear on Appendix VIII. These materials are important industrial chemicals that have been found frequently at hazardous waste sites. They are potentially useful for identifying and characterizing ground-water contamination. Analysts can identify them using the same generally applicable methods recommended for the Appendix VIII constituents on the short-term guidance list. Performing these additional analyses should not consume a significant share of laboratory resources or contribute to a general delay in performing Appendix VIII analyses. Moreover, requiring analysis of these chemicals under RCRA will promote consistency between the RCRA and Superfund hazardous waste programs. The 25 chemicals are listed in the second attachment to this document.

B. Regulatory Basis for Exercising Discretion

Waiving Analysis in Permit Applications

In some circumstances EPA's existing regulations require owners and operators of hazardous waste facilities to submit full Appendix VIII analyses as part of their permit applications. If a plume of contamination from a regulated unit has entered ground water at the time of permit application, 40 CFR §270.14(c)(4) requires the owner or operator to characterize the plume by analyzing for "each" Appendix VIII constituent. If hazardous constituents are detected, owners or operators must submit all the data needed to support a compliance monitoring or corrective action program, including an analysis for all Appendix VIII constituents. 40 CFR §270.14(c)(7), (c)(8).

When a facility falls within any of these requirements, Regional Offices can use the flexibility provided in 40 CFR §270.14(a) to reduce the Appendix VIII burden. That section provides that the director of a permit program may "make allowance" on a "case-by-case" basis where an owner or operator demonstrates that he or she is unable to submit any information required to support a Part B permit application. Because

full Appendix VIII analyses conflict with the need to act expeditiously on permits, EPA believes it is appropriate to use the waiver provision in §270.14(a) where owners and operators demonstrate that they cannot analyze for specific Appendix VIII constituents or cannot do so within a reasonable time. Regions may use the attached lists as guides to evaluating these demonstrations. Use of the waiver provision will enable a Regional Office to find that the Appendix VIII portion of a permit application is complete once the owner or operator submits data on all non-waived constituents.

The problems described in the technical discussion cover a range of analytical difficulties. For some constituents analysis is virtually impossible. For example, analysts cannot identify constituents that actually decompose in water. For other constituents, analysis is difficult, but conceptually possible if an owner or operator has unlimited time. Some constituents require more time and effort than others. Increasing the number of difficult constituents that must be analyzed also increases the time and effort needed.

Permit writers should consider this range of problems when evaluating waiver requests for Appendix VIII constituents. Where analysis is impossible, waivers are appropriate. Where analysis is theoretically possible, permit writers should balance the need to issue permits in a timely manner against the need to obtain data for constituents which are difficult to analyze. Although EPA believes that the revised list attached to this document strikes an appropriate balance for most facilities, site-specific factors at particular facilities may warrant different conclusions for some constituents. For example, if a Region knows that a facility produces an Appendix VIII constituent as a product or by-product, the Region may want to consider requiring the owner or operator to develop an analytical method for that constituent. The Region may conclude that the increased environmental protection provided by information on this constituent would justify a limited delay for an attempt to develop an analytical method. Also, a facility that produces a compound may have developed a method to analyze for its presence in ground water. Regional Offices might find that this expertise would make analysis feasible within a reasonable time.

As explained above, methods developed for a particular facility would probably be case-specific and unlikely to produce reliable data for the same constituent at other facilities. Hence, EPA does not anticipate that such methods will be generally applicable. If, however, EPA finds a method suitable for general use while this guidance is still in effect, EPA will advise the Regional Offices that the method is available for general analysis at all facilities.

Permit writers, if they grant waivers for any Appendix VIII constituents, must also write permit conditions that will reopen the waivers when EPA completes the first stage of its Appendix VIII rulemaking. This will authorize the Regional Administrator to modify the permit to require owners and operators to analyze for any constituents found on the final ground-water monitoring list that were waived at the time of permit application because the Region found it was impossible or too time-consuming to test for them. Inclusion of any such constituents in the final ground-water monitoring requirements would be based on new information developed during the rulemaking that changed the Agency's current opinion on the constituent's general analytical potential. This new information would authorize the Regional Administrator to require a permit modification under §270.41(a)(2).

Requiring Analysis of Additional Chemicals

EPA is also recommending that owners and operators of land-based facilities should generally analyze for 25 hazardous substances included in the second list attached to this guidance document. These chemicals appear on the Superfund "Hazardous Substances List," but do not appear in Appendix VIII. Permit writers may require owners and operators to analyze for these chemicals by imposing a permit condition under 40 CFR §270.32(b)(2). This new provision is based on the "omnibus" condition authority added to Section 3005(c) of RCRA by the Hazardous and Solid Waste Amendments of 1984. As explained in the preamble to the new regulation, the new provision authorizes EPA to add permit conditions beyond existing regulatory requirements where such conditions are necessary to protect human health and the environment. 50 Fed. Reg. 28722 (July 15, 1985). To assist in implementing these conditions, permit writers should request owners and operators to submit analytical data on these constituents as part of their permit applications since these 25 substances are commonly found at hazardous waste sites and standard test methods should produce reliable ground-water analyses. EPA believes that RCRA permits will better protect health and environment if they require these additional analyses. Permit writers, of course, should exercise discretion if they find site-specific problems that conflict with these general positions.

Appendix VIII Constituents Recommended for Analysis

Common Name	CAS RN	Systematic Name
Acetonitrile	75-05-8	Acetonitrile
Acetophenone	98-86-2	Ethanone, 1-phenyl-
2-Acetylaminofluorene	53-96-3	Acetamide, N-9H-fluoren-2-yl-
Acrolein	107-02-8	2-Propenal
Acrylonitrile	107-13-1	2-Propenenitrile
Aldrin	309-00-2	1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1 α ,4 α ,4a β ,5 α ,8 α ,8a β)-
Allyl alcohol	107-18-6	2-Propen-1-ol
4-Aminobiphenyl	92-67-1	[1,1'-Biphenyl]-4-amine
Aniline	62-53-3	Benzenamine
Antimony (total)	7440-36-0	Antimony
Aramite	140-57-8	Sulfurous acid, 2-chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester
Arsenic (total)	7440-38-2	Arsenic
Barium (total)	7440-39-3	Barium
Benz[a]anthracene	56-55-3	Benz[a]anthracene
Benzene	71-43-2	Benzene

Common Name	CAS RN	Systematic Name
Benzenethiol	108-98-5	Benzenethiol
Benzidine	92-87-5	[1,1'-Biphenyl]-4,4'-diamine
Benzo[b]fluoranthene	205-99-2	Benzo[<i>b</i>]acephenanthrylene
Benzo[a]pyrene	50-32-8	Benzo[<i>a</i>]pyrene
p-Benzoquinone	106-51-4	2,5-Cyclohexadiene-1,4-dione
Beryllium (total)	7440-41-7	Beryllium
Bis(2-chloroethoxy)methane	111-91-1	Ethane, 1,1'-(methylenebis(oxy))bis[2-chloro-
Bis(2-chloroethyl) ether	111-44-4	Ethane, 1,1'-oxybis[2-chloro-
Bis(2-chloroisopropyl) ether	108-60-1	Propane, 2,2'-oxybis[1-chloro-
Bis(2-ethylhexyl) phthalate	117-81-7	1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester
Bromomethane	74-83-9	Methane, bromo-
4-Bromophenyl phenyl ether	101-55-3	Benzene, 1-bromo-4-phenoxy-
Butyl benzyl phthalate	85-68-7	1,2-Benzenedicarboxylic acid, butyl phenylmethyl ester
2-sec-Butyl-4,6-dinitrophenol	88-85-7	Phenol, 2-(1-methylpropyl)-4,6-dinitro-
Cadmium (total)	7440-43-9	Cadmium
Carbon disulfide	75-15-0	Carbon disulfide

Common Name	CAS RN	Systematic Name
Chlordane	57-74-9	4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-
Chloroethane	75-00-3	Ethane, chloro-
p-Chloroaniline	106-47-8	Benzenamine, 4-chloro-
Chlorobenzene	108-90-7	Benzene, chloro-
Chlorobenzilate	510-15-6	Benzenesacetic acid, 4-chloro- α -(4-chlorophenyl)- α -hydroxy-, ethyl ester
2-Chloro-1,3-butadiene	126-99-8	1,3-Butadiene, 2-chloro-
p-Chloro-m-cresol	59-50-7	Phenol, 4-chloro-3-methyl-
2-Chloroethyl vinyl ether	110-75-8	Ethene, (2-chloroethoxy)-
Chloroform	67-66-3	Methane, trichloro-
Chloromethane	74-87-3	Methane, chloro-
2-Chloronaphthalene	91-58-7	Naphthalene, 2-chloro-
2-Chlorophenol	95-57-8	Phenol, 2-chloro-
3-Chloropropene	107-05-1	1-Propene, 3-chloro-
3-Chloropropionitrile	542-76-7	Propanenitrile, 3-chloro-
Chromium (total)	7440-47-3	Chromium

Common Name	CAS RN	Systematic Name
Chrysene	218-01-9	Chrysene
Copper (total)	7440-50-8	Copper
Acenaphthene	83-32-9	Acenaphthylene, 1,2-dihydro-
Acenaphthalene	208-96-8	Acenaphthylene
Anthracene	120-12-7	Anthracene
Benzo(ghi)perylene	191-24-2	Benzo(ghi)perylene
Benzo(k)fluoranthene	207-08-9	Benzo(k)fluoranthene
Fluorene	86-73-7	9H-fluorene
Phenanthrene	85-01-8	Phenanthrene
Pyrene	129-00-0	Pyrene
ortho-Cresol	95-48-7	Phenol, 2-methyl-
para-Cresol	106-44-5	Phenol, 4-methyl-
Cyanide	57-12-5	Cyanide
DDT	72-54-8	Benzene, 1,1'-(2,2-dichloroethylidene)bis(4-chloro-
DDE	72-55-9	Benzene, 1,1'-(dichloroethenylidene)bis(4-chloro-
DDT	50-29-3	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis(4-chloro-

Common Name	CAS BN	Systematic Name
Dibenz[a,h]anthracene	53-70-3	Dibenz[a,h]anthracene
Dibenz[a,e]pyrene	192-65-4	Naphtho[1,2,3,4-def]chrysene
Dibenz[a,h]pyrene	189-64-0	Dibenzo[b,def]chrysene
Dibenz[a,i]pyrene	189-55-9	Benzo[frst]pentaphene
1,2-Dibromo-3-chloropropane	96-12-8	Propane, 1,2-dibromo-3-chloro-
1,2-Dibromoethane	106-93-4	Ethane, 1,2-dibromo-
Dibromomethane	74-95-3	Methane, dibromo-
Di-n-butyl phthalate	84-74-2	1,2-Benzenedicarboxylic acid, dibutyl ester
o-Dichlorobenzene	95-50-1	Benzene, 1,2-dichloro-
m-Dichlorobenzene	541-73-1	Benzene, 1,3-dichloro-
p-Dichlorobenzene	106-46-7	Benzene, 1,4-dichloro-
3,3'-Dichlorobenzidine	91-94-1	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro-
trans-1,4-Dichloro-2-butene	110-57-6	2-Butene, 1,4-dichloro-, (E)-
Dichlorodifluoromethane	75-71-8	Methane, dichlorodifluoro-
1,1-Dichloroethane	75-34-3	Ethane, 1,1-dichloro-
1,2-Dichloroethane	107-06-2	Ethane, 1,2-dichloro-

Common Name	CAS RN	Systematic Name
trans-1,2-Dichloroethene	156-60-5	Ethene, 1,2-dichloro-, (E)-
1,1-Dichloroethylene	75-35-4	Ethene, 1,1-dichloro-
Dichloromethane	75-09-2	Methane, dichloro-
2,4-Dichlorophenol	120-83-2	Phenol, 2,4-dichloro-
2,6-Dichlorophenol	87-65-0	Phenol, 2,6-dichloro-
2,4-Dichlorophenoxyacetic acid	94-75-7	Acetic acid, (2,4-dichlorophenoxy)-
1,2-Dichloropropane	78-87-5	Propane, 1,2-dichloro-
cis-1,3-Dichloropropene	10061-01-5	1-Propene, 1,3-dichloro-, (Z)-
trans-1,3-Dichloropropene	10061-02-6	1-Propene, 1,3-dichloro-, (E)-
Dieldrin	60-57-1	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a, 2,2a,3,6,6a,7,7a-octahydro-, (1a α ,2 β ,2a α ,3 β ,6 β ,6a α ,7 β ,7a α)-
Diethyl phthalate	84-66-2	1,2-Benzenedicarboxylic acid, diethyl ester
O,O-Diethyl O-2-pyrazinyl phosphorothioate	297-97-2	Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester
3,3'-Dimethoxybenzidine	119-90-4	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethoxy-
p-Dimethylaminoazobenzene	60-11-7	Benzenamine, N,N-dimethyl-4-(phenylazo)-
7,12-Dimethylbenz[alanthracene	57-97-6	Benz[alanthracene, 7,12-dimethyl-

Common Name	CAS RN	Systematic Name
3,3'-Dimethylbenzidine	119-93-7	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethyl-
alpha, alpha-Dimethylphenethylamine	122-09-8	Benzeneethanamine, α, α -dimethyl-
2,4-Dimethylphenol	105-67-9	Phenol, 2,4-dimethyl-
Dimethyl phthalate	131-11-3	1,2-Benzenedicarboxylic acid, dimethyl ester
meta-Dinitrobenzene	100-25-4	Benzene, 1,4-dinitro-
4,6-Dinitro-o-cresol	534-52-1	Phenol, 2-methyl-4,6-dinitro-
2,4-Dinitrophenol	51-28-5	Phenol, 2,4-dinitro-
2,4-Dinitrotoluene	121-14-2	Benzene, 1-methyl-2,4-dinitro-
2,6-Dinitrotoluene	606-20-2	Benzene, 2-methyl-1,3-dinitro-
Di-n-octyl phthalate	117-84-0	1,2-Benzenedicarboxylic acid, dioctyl ester
1,4-Dioxane	123-91-1	1,4-Dioxane
Diphenylamine	122-39-4	Benzenamine, N-phenyl-
1,2-Diphenylhydrazine	122-66-7	Hydrazine, 1,2-diphenyl-
Di-n-propylnitrosamine	621-66-7	1-Propanamine, N-nitroso-N-propyl-
Disulfoton	298-04-4	Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl] ester

Common Name	CAS RN	Systematic Name
Endosulfan I	959-08-8	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide, (3 α ,5 α ,6 α ,9 α ,9 β)-
Endosulfan II	33213-65-9	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide, (3 α ,5 α ,6 α ,9 β ,9 α)-
Endrin	72-20-8	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1 α ,2 β ,2 α ,3 α ,6 α ,6 α ,7 β ,7 α)-
Endrin aldehyde	7421-93-4	1,2,4-Methenocyclopenta[cd]pentalene-5-carboxaldehyde, 2,2a,3,3,4,7-hexachlorodecahydro-, (1 α ,2 β ,2 α ,3 β ,4 β ,5 β ,6 α ,6 β ,7 α)-
Ethyl cyanide	107-12-0	Propanenitrile
Ethylene oxide	75-21-8	Oxirane
Ethyl methacrylate	97-63-2	2-Propenoic acid, 2-methyl-, ethyl ester
Fluoranthene	206-44-0	Fluoranthene
Chlorodibromomethane	124-48-1	Methane, dibromochloro-
Bromodichloromethane	75-27-4	Methane, bromodichloro-
Heptachlor	76-44-8	4,7-Methano-1H-indene, 1,4,5,6,7,8-heptachloro-3a,4,7,7a-tetrahydro-
Heptachlor epoxide	1024-57-3	2,5-Methano-2H-indeno[1,2-b]oxirene, 2,3,4,5,6,7,7-heptachloro-1a,1b,5,5a,6,6a-hexahydro-, (1 α ,2 α ,1 β ,2 α ,5 α ,5 α ,6 β ,6 β ,6 α)-
Hexachlorobenzene	118-74-1	Benzene, hexachloro-

Common Name	CAS RN	Systematic Name
Hexachlorobutadiene	87-68-3	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-
alpha-BHC	319-84-6	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1 α ,2 α ,3 β ,4 α ,5 β ,6 β)-
beta-BHC	319-85-7	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1 α ,2 β ,3 α ,4 β ,5 α ,6 β)-
delta-BHC	319-86-8	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1 α ,2 α ,3 α ,4 β ,5 α ,6 β)-
gamma-BHC	58-89-9	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1 α ,2 α ,3 β ,4 α ,5 α ,6 β)-
Hexachlorocyclopentadiene	77-47-4	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-
Hexachlorodibenzo-p-dioxins		
Hexachlorodibenzofurans		
Hexachloroethane	67-72-1	Ethane, hexachloro-
Isodrin	465-73-6	1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1 α ,4 α ,4 α β ,5 β ,8 β ,8 α β)-
Hexachlorophene	70-30-4	Phenol, 2,2'-methylenebis(3,4,6-trichloro-
Hexachloropropene	1088-71-7	1-Propene, 1,1,2,3,3,3-hexachloro-
Fluoride	16984-48-8	Fluoride
Sulfide	18496-25-8	Sulfide
Indeno(1,2,3-cd)pyrene	193-39-5	Indeno(1,2,3-cd)pyrene

Common Name	CAS RN	Systematic Name
Iodomethane	74-88-4	Methane, iodo-
Isobutyl alcohol	78-83-1	1-Propanol, 2-methyl-
Isosafrole	120-58-1	1,3-Benzodioxole, 5-(1-propenyl)-
Kepone	143-50-0	1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5,5a,5b,6-decachlorooctahydro-
Lead (total)	7439-02-1	Lead
Malononitrile	109-77-3	Propanedinitrile
Mercury (total)	7439-97-6	Mercury
Methacrylonitrile	126-98-7	2-Propenenitrile, 2-methyl-
Methapyrilene	91-80-5	1,2-Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'-2-thienylmethyl-
Methoxychlor	72-43-5	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis(4-methoxy-
3-Methylcholanthrene	56-49-5	Benz[<i>jj</i>]aceanthrylene, 1,2-dihydro-3-methyl-
4,4'-Methylenebis(2-chloroaniline)	101-14-4	Benzenamine, 4,4'-methylenebis(2-chloro-
Methyl ethyl ketone	78-93-3	2-Butanone
Methyl methacrylate	80-62-6	2-Propenoic acid, 2-methyl-, methyl ester
Methyl methanesulfonate	66-27-3	Methanesulfonic acid, methyl ester

Common Name	CAS RN	Systematic Name
Methyl parathion	298-00-0	Phosphorothioic acid, O,O-dimethyl O-(4-nitrophenyl) ester
Naphthalene	91-20-3	Naphthalene
1,4-Naphthoquinone	130-15-4	1,4-Naphthalenedione
1-Naphthylamine	134-32-7	1-Naphthalenamine
2-Naphthylamine	91-59-8	2-Naphthalenamine
Nickel (total)	7440-02-0	Nickel
p-Nitroaniline	100-01-6	Benzenamine, 4-nitro-
Nitrobenzene	98-95-3	Benzene, nitro-
4-Nitrophenol	100-02-7	Phenol, 4-nitro-
N-Nitrosodiphenylamine	86-30-6	Benzenamine, N-nitroso-N-phenyl-
N-Nitrosodi-n-butylamine	924-16-3	1-Butanamine, N-butyl-N-nitroso-
N-Nitrosodiethylamine	55-18-5	Ethanamine, N-ethyl-N-nitroso-
N-Nitrosodimethylamine	62-75-9	Methanamine, N-methyl-N-nitroso-
N-Nitrosomethylethylamine	10595-95-6	Ethanamine, N-methyl-N-nitroso-
N-Nitrosomorpholine	59-89-2	Morpholine, 4-nitroso-
N-Nitrosopiperidine	100-75-4	Piperidine, 1-nitroso-

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Common Name	CAS RN	Systematic Name
N-Nitrosopyrrolidine	930-55-2	pyrrolidine, 1-nitroso-
5-Nitro-o-toluidine	99-55-8	Benzenamine, 2-methyl-5-nitro-
Osmium (total)	7440-04-2	Osmium
Parathion	56-38-2	phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester
Pentachlorobenzene	608-93-5	Benzene, pentachloro-
Pentachlorodibenzo-p-dioxins		
Pentachlorodibenzofurans		
Pentachloroethane	76-01-7	Ethane, pentachloro-
Pentachloronitrobenzene	82-68-8	Benzene, pentachloronitro-
Pentachlorophenol	87-86-5	Phenol, pentachloro-
Phenacetin	62-44-2	Acetamide, N-(4-ethoxyphenyl)-
Phenol	108-95-2	Phenol
Phorate	298-02-2	phosphorodithioic acid, O,O-diethyl S-((ethylthio)methyl) ester
Famphur	52-85-7	Phosphorothioic acid, O-(4-((dimethylamino)sulfonyl)phenyl) O,O-dimethyl ester.
2-Picoline	109-06-8	Pyridine, 2-methyl-

Common Name	CAS RN	Systematic Name
Aroclor 1016	12674-11-2	Aroclor 1016
Aroclor 1221	11104-28-2	Aroclor 1221
Aroclor 1232	11141-16-5	Aroclor 1232
Aroclor 1242	53469-21-9	Aroclor 1242
Aroclor 1248	12672-29-6	Aroclor 1248
Aroclor 1254	11097-69-1	Aroclor 1254
Aroclor 1260	11096-82-5	Aroclor 1260
Pronamide	23950-58-5	Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-
2-Propyn-1-ol	107-19-7	2-Propyn-1-ol
Pyridine	110-86-1	Pyridine
Resorcinol	108-46-3	1,3-Benzenediol
Safrole	94-59-7	1,3-Benzodioxole, 5-(2-propenyl)-
Selenium (total)	7782-49-2	Selenium
Silver (total)	7440-22-4	Silver
1,2,4,5-Tetrachlorobenzene	95-94-3	Benzene, 1,2,4,5-tetrachloro-
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	Dibenzo[b,e][1,4]dioxin, 2,3,7,8-tetrachloro-

Common Name	CAS RN	Systematic Name	Reason for Change
Ethylenediamine	151-56-4	Aziridine	1,3,5
Ethylene oxide	75-21-8	Oxirane	
Ethylenethiourea	96-45-7	2-Imidazolidinethione	1
Ethyl methacrylate	97-63-2	2-Propenoic acid, 2-methyl-, ethyl ester	
Ethyl methanesulfonate	62-50-0	Methanesulfonic acid, ethyl ester	3
Fluoranthene	206-44-0	Fluoranthene	
Fluorine	7782-41-4	Fluorine	3,6
2-Fluoroacetamide	640-19-7	Acetamide, 2-fluoro-	7
Fluoroacetic acid, sodium salt	62-74-8	Acetic acid, fluoro-, sodium salt	6
Formaldehyde	50-00-0	Formaldehyde	6
Formic acid	64-18-6	Formic acid	1
Glycidylaldehyde	765-34-4	Oxiranecarboxaldehyde	3,6
Halomethane, H.O.S.*			2
Heptachlor	76-44-8	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-	
Heptachlor epoxide	1024-57-3	2,5-Methano-2H-indeno[1,2-b]oxirene, 2,3,4,5,6,7,7-heptachloro-1a,1b,5,5a,6,6a-hexahydro-, (1a α ,1b β ,2 α ,5 α ,5a β ,6 β ,6a α)-	

Common Name	CAS RN	Systematic Name
Trichloromethanethiol	75-70-7	Methanethiol, trichloro-
Trichloromonofluoromethane	75-69-4	Methane, trichlorofluoro-
2,4,5-Trichlorophenol	95-95-4	Phenol, 2,4,5-trichloro-
2,4,6-Trichlorophenol	88-06-2	Phenol, 2,4,6-trichloro-
2,4,5-T	93-76-5	Acetic acid, (2,4,5-trichlorophenoxy)-
Silvex	93-72-1	Propanoic acid, 2-(2,4,5-trichlorophenoxy)-
1,2,3-Trichloropropane	96-18-4	Propane, 1,2,3-trichloro-
Tris(2,3-dibromopropyl) phosphate	126-72-7	1-Propanol, 2,3-dibromo-, phosphate (3:1)
Vanadium (total)	7440-62-2	Vanadium
Vinyl chloride	75-01-4	Ethene, chloro-
Zinc (total)	7440-66-6	Zinc

Superfund Constituents Recommended for Analysis

Common Name	CAS RN	Systematic Name
Benzoic acid	65-85-0	Benzoic acid
Acetone	67-64-1	2-Propanone
Isophorone	78-59-1	2-Cyclohexen-1-one, 3,5,5-trimethyl-
2-Nitroaniline	88-74-4	Benzenamine, 2-nitro-
2-Nitrophenol	88-75-5	Phenol, 2-nitro-
2-Methylnaphthalene	91-57-6	Naphthalene, 2-methyl-
3-Nitroaniline	99-09-2	Benzenamine, 3-nitro-
Ethyl benzene	100-41-4	Benzene, ethyl-
Styrene	100-42-5	Benzene, ethenyl-
Benzyl alcohol	100-51-6	Benzenemethanol
Vinyl acetate	108-05-4	Acetic acid ethenyl ester
4-Methyl-2-pentanone	108-10-1	2-Pentanone, 4-methyl-
Dibenzofuran	132-64-9	Dibenzofuran
2-Hexanone	591-78-6	2-Hexanone
Xylene (total)	1330-20-7	Benzene, dimethyl-
4-Chlorophenyl phenyl ether	7005-72-3	Benzene, 1-chloro-4-phenoxy-

Common Name	CAS RN	Systematic Name
Aluminum	7429-90-5	Aluminum
Iron	7439-89-6	Iron
Magnesium	7439-95-4	Magnesium
Manganese	7439-96-5	Manganese
Potassium	7440-09-7	Potassium
Sodium	7440-23-5	Sodium
Tin	7440-31-5	Tin
Cobalt	7440-48-4	Cobalt
Calcium	7440-70-2	Calcium

Annotated List of All Appendix VIII Constituents

The following table briefly summarizes the reasons for the changes in going from the Appendix VIII list of Hazardous Constituents to the revised list recommended for general ground-water monitoring. The first column of the table provides the "Common Name" or hazardous constituent name in the same order as it appears on the Appendix VIII list. The second column indicates the "CAS RN" or Chemical Abstract Service Registry Number. The third column lists the "Systematic Name" which corresponds with the CAS RN. The fourth or last column provides the reason(s) for a specific hazardous constituent being changed on the list, coded as follows:

1. The hazardous constituent can be analyzed only by the HPLC (High Performance Liquid Chromatography) method, which is inappropriate for complex, unknown ground-water samples.
2. The hazardous constituent is a category which cannot be analyzed as a specific entity. (All such categories have representative members on the revised list.)
3. The hazardous constituent is unstable in water.
4. The hazardous constituent is an inorganic which ionizes in water.
5. Standards are not readily available for the hazardous constituent.
6. No acceptable method is available for the hazardous constituent.
7. The hazardous constituent is an organometallic which cannot be analyzed as a specific entity.

Common Name	CAS RN	Systematic Name	Reason For Change
Acetonitrile	75-05-8	Acetonitrile	
Acetophenone	98-86-2	Ethanone, 1-phenyl-	
Warfarin and salts			1,2
2-Acetylaminofluorene	53-86-3	Acetamide, N-9H-fluoren-2-yl-	
Acetyl chloride	75-36-5	Acetyl chloride	3
1-Acetyl-2-thiourea	591-08-2	Acetamide, N-(aminothioacetyl)-	1
Acrolein	107-02-8	2-Propenal	
Acrylamide	79-06-01	2-Propenamide	1
Acrylonitrile	107-13-1	2-Propenenitrile	
Aflatoxins			1,2
Aldrin	309-00-2	1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,6a,5,8,8a-hexahydro-, (1S,4S,6aR,5aR,8aR,8aR)-	
Allyl alcohol	107-18-6	2-Propen-1-ol	
Aluminum phosphide	20859-73-8	Aluminum phosphide (AlP)	3
4-Aminobiphenyl	92-67-1	[1,1'-Biphenyl]-4-amine	

Common Name	CAS RN	Systematic Name	Reason for Change
Mitomycin C	50-07-7	Azirino[2',3':3,4]pyrrolo[1,2-a]indole-4,7-dione, 6-amino-8-(((amino-carbonyl)oxymethyl)-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-11aH (1a α , 8 β , 8a α , 8b α)).	1
5-(Aminomethyl)-3-isoxazolol	2763-96-4	3(2H)-Isoxazolone, 5-(aminomethyl)-	1
Amitrole	61-82-5	1H-1,2,4-Triazol-3-amine	1
Aniline	62-53-3	Benzenamine	
Antimony and compounds, N.O.S.*			2
Aramite	140-57-6	Sulfurous acid, 2-chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester	
Arsenic and compounds, N.O.S.*			2
Arsenic acid	7778-39-4	Arsenic acid (H ₃ AsO ₄)	4
Arsenic pentoxide	1303-28-2	Arsenic oxide (As ₂ O ₅)	4
Arsenic trioxide	1327-53-3	Arsenic oxide (As ₂ O ₃)	4
Auramine	492-80-8	Benzenamine, 4,4'-carbonimidoylbis[N,N-dimethyl-	1,5
Azaserine	115-02-6	L-Serine, diazoacetate (ester)	1
Barium and compounds, N.O.S.*			2
Barium cyanide	542-62-1	Barium cyanide (Ba(CN) ₂)	4
Benz[c]acridine	225-51-4	Benz[c]acridine	5

Common Name	CAS RN	Systematic Name	Reason For Change
Benz(a)anthracene	56-55-3	Benz(a)anthracene	
Benzene	71-43-2	Benzene	
Benzenearsonic acid	98-05-5	Arsonic acid, phenyl-	1
Benzene, dichloromethyl-	98-87-3	Benzene, (dichloromethyl)-	3
Benzenethiol	108-98-5	Benzenethiol	
Benidine	92-87-5	(1,1'-Biphenyl)-4,4'-diamine	
Benzo(b)fluoranthene	205-99-2	Benz(e)acephenanthrylene	
Benzo(j)fluoranthene	205-82-3	Benzo(j)fluoranthene	6
Benzo(a)pyrene	50-32-8	Benzo(a)pyrene	
p-Benzoquinone	106-51-4	2,5-Cyclohexadiene-1,4-dione	
Benotrichloride	98-07-7	Benzene, (trichloromethyl)-	3
Benzyl chloride	100-44-7	Benzene, (chloromethyl)-	3
Beryllium and compounds, N.O.S.*			2
Bis(2-chloroethoxy)methane	111-91-1	Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-	
Bis(2-chloroethyl) ether	111-44-4	Ethane, 1,1'-oxybis[2-chloro-	
Chloronaphazene	494-03-1	2-Naphthalenamine, N,N-bis[2-(chloroethyl)-	1,5

Common Name	CAS RN	Systematic Name	Reason for Change
Bis(2-chloroisopropyl) ether	108-60-1	Propane, 2,2'-oxybis(1-chloro-	
Bis(chloromethyl) ether	542-88-1	Methane, oxybis(chloro-	3
Bis(2-ethylhexyl) phthalate	117-81-7	1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester	
Bromoacetone	598-31-2	2-Propanone, 1-bromo-	6
Bromomethane	74-83-9	Methane, bromo-	
4-Bromophenyl phenyl ether	101-55-3	Benzene, 1-bromo-4-phenoxy-	
Brucine	357-57-3	Strychnidin-10-one, 2,3-dimethoxy-	1
2-Butanone peroxide	1338-23-4	2-Butanone, peroxide	73
Butyl benzyl phthalate	85-68-7	1,2-Benzenedicarboxylic acid, butyl phenylmethyl ester	
2-sec-Butyl-4,6-dinitrophenol	88-85-7	Phenol, 2-(1-methylpropyl)-4,6-dinitro-	
Cadmium and compounds, H.O.S.*			2
Calcium chromate	13765-19-0	Chromic acid (H_2CrO_4), calcium salt (1:1)	4
Calcium cyanide	592-01-8	Calcium cyanide ($Ca(CN)_2$)	4
Carbon disulfide	75-15-0	Carbon disulfide	
Carbon oxyfluoride	353-50-4	Carbonic difluoride	3
Chloral	75-87-6	Acetaldehyde, trichloro-	3,6

Common Name	CAS RN	Systematic Name	Reason For Change
Chlorambucil	305-03-3	Benzenebutanoic acid, 4-[(bis(2-chloroethyl)amino)-	1
Chlordane	57-74-9	4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-	
Chlorinated benzenes, M.O.S.*			2
Chlorinated ethane, M.O.S.*			2
Chlorinated fluorocarbons, M.O.S.*			2
Chlorinated naphthalene, M.O.S.*			2
Chlorinated phenol, M.O.S.*			2
Chloroacetaldehyde	107-20-0	Acetaldehyde, chloro-	3
Chloroalkyl ethers, N.O.S.*			2
p-Chloroaniline	106-47-8	Benzenamine, 4-chloro-	
Chlorobenzene	108-90-7	Benzene, chloro-	
Chlorobenzilate	510-15-6	Benzenecacetic acid, 4-chloro- α -(4-chlorophenyl)- α -hydroxy-ethyl ester	
2-Chloro-1,3-butadiene	126-99-8	1,3-Butadiene, 2-chloro-	
p-Chloro-m-cresol	59-50-7	Phenol, 4-chloro-3-methyl-	
1-Chloro-2,3-epoxypropane	106-89-8	Oxirane, (chloromethyl)-	3

Common Name	CAS RN	Systematic Name	Reason for Change
2-Chloroethyl vinyl ether	110-75-8	Ethene, (2-chloroethoxy)-	
Chloroform	67-66-3	Methane, trichloro-	
Chloromethane	74-87-3	Methane, chloro-	
Chloromethyl methyl ether	107-30-2	Methane, chloromethoxy-	3
2-Chloronaphthalene	91-58-7	Naphthalene, 2-chloro-	
2-Chlorophenol	95-57-8	Phenol, 2-chloro-	
1-(o-Chlorophenyl)thiourea	5344-82-1	Thiourea, (2-chlorophenyl)-	1,5
3-Chloropropene	107-05-1	1-Propene, 3-chloro-	
3-Chloropropionitrile	542-76-7	Propanenitrile, 3-chloro-	
Chromium and compounds, M.O.S.*			2
Chrysene	218-01-9	Chrysene	
Citrus red No. 2	6358-53-8	2-Naphthalenol, 1-[(2,5-dimethoxyphenyl)azo]-	1,5
Coal tars			2
Copper cyanide	14763-77-0	Copper cyanide (Cu(CN) ₂)	4
Creosote			2
Cresols			2

Common Name	CAS RN	Systematic Name	Reason for Change
Crotonaldehyde	4170-30-3	2-Butenal	3,6
Cyanides (soluble salts and complexes), N.O.S.*			2
Cyanogen	2074-87-5	Cyanogen	4
Cyanogen bromide	506-68-3	Cyanogen bromide	4
Cyanogen chloride	506-77-4	Cyanogen chloride	4
Cytasin	14901-08-7	β , -D-Glucopyranoside, (methyl-OMW-azoxy)methyl	1
2-Cyclohexyl-4,6-dinitrophenol	131-89-5	Phenol, 2-cyclohexyl-4,6-dinitro-	5
Cyclophosphamide	50-18-0	2H-1,3,2-Oxazaphosphorin-2-amine, N,N-bis(2-chloroethyl)tetrahydro-, 2-oxide	1
Daunomycin	20830-81-3	5,12-Naphthacenedione, 8-acetyl-10-((3-amino-2,3,6-trideoxy- α -L- xyo-hexopyranosyl)oxy)-7,8,9,10-tetrahydro-6,8,11-trihydroxy- 1-methoxy-, (8S-cis)-	1
DDD	72-54-8	Benzene, 1,1'-(2,2-dichloroethylidene)bis[4-chloro-	
DDE	72-55-9	Benzene, 1,1'-(dichloroethenylidene)bis[4-chloro-	
DDT	50-29-3	Benzene, 1,1'-(2,2-trichloroethylidene)bis[4-chloro-	
Diatlate			1
Dibenz(a,h)acridine	226-36-8	Dibenz(a,h)acridine	5

Common Name	CAS RN	Systematic Name	Reason for Change
Dibenz[a,j]acridine	224-42-0	Dibenz[a,j]acridine	5
Dibenz[a,h]anthracene	53-70-3	Dibenz[a,h]anthracene	
7H-Dibenzofc,glcarbazole	194-59-2	7H-Dibenzofc,glcarbazole	5
Dibenzofa,e]pyrene	192-65-4	Naphtho[1,2,3,4-def]chrysene	
Dibenzofa,h]pyrene	189-64-0	Dibenzofb,def]chrysene	
Dibenzofa,i]pyrene	189-55-9	Benzofrst]pentaphene	
1,2-Dibromo-3-chloropropane	96-12-8	Propane, 1,2-dibromo-3-chloro-	
1,2-Dibromoethane	106-93-4	Ethane, 1,2-dibromo-	1
Dibromomethane	74-95-3	Methane, dibromo-	
Di-n-butyl phthalate	84-74-2	1,2-Benzenedicarboxylic acid, dibutyl ester	
o-Dichlorobenzene	95-50-1	Benzene, 1,2-dichloro-	
m-Dichlorobenzene	541-73-1	Benzene, 1,3-dichloro-	
p-Dichlorobenzene	106-46-7	Benzene, 1,4-dichloro-	
Dichlorobenzene, M.O.S.*			2
3,3'-Dichlorobenzidine	91-94-1	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro-	
trans-1,4-Dichloro-2-butene	110-57-6	2-Butene, 1,4-dichloro-, (E)-	

Common Name	CAS RN	Systematic Name	Reason for Change
Dichlorodifluoromethane	75-71-8	Methane, dichlorodifluoro-	
1,1-Dichloroethane	75-34-3	Ethane, 1,1-dichloro-	
1,2-Dichloroethane	107-06-2	Ethane, 1,2-dichloro-	
trans-1,2-Dichloroethene	156-60-5	Ethene, 1,2-dichloro-, (E)-	
Dichloroethylene, N.O.S.*			2
1,1-Dichloroethylene	75-35-4	Ethene, 1,1-dichloro-	
Dichloromethane	75-09-2	Methane, dichloro-	
2,4-Dichlorophenol	120-83-2	Phenol, 2,4-dichloro-	
2,6-Dichlorophenol	87-65-0	Phenol, 2,6-dichloro-	
2,4-Dichlorophenoxyacetic acid (2,4-D), salts and esters			2
Dichlorophenylarsine	696-28-6	Arsonous dichloride, phenyl-	5,7
Dichloropropane, N.O.S.*			2
1,2-Dichloropropane	78-87-5	Propane, 1,2-dichloro-	
Dichloropropanol, N.O.S.*			2
Dichloropropene, N.O.S.*			2

Common Name	CAS RN	Systematic Name	Reason For Change
1,3-Dichloropropene			2
Dieldrin	60-57-1	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1a α ,2 β ,2a α ,3 β ,6 β ,6a α ,7 β ,7a α).	
1,2:3,4-Diepoxybutane	1464-53-5	2,2'-Bioxirane	6
Diethylarsine	692-42-2	Arsine, diethyl-	5,7
N,N-Diethylhydrazine	616-40-0	Hydrazine, 1,1-diethyl-	5
O,O-Diethyl S-methyl ester of phosphorodithioic acid	3288-58-2	Phosphorodithioic acid, O,O-diethyl S-methyl ester	5
O,O-Diethylphosphoric acid, O-p-nitro-phenyl ester	311-45-5	Phosphoric acid, diethyl 4-nitrophenyl ester	3
Diethyl phthalate	84-66-2	1,2-Benzenedicarboxylic acid, diethyl ester	
O,O-Diethyl O-2-pyrazinyl phosphorothioate	297-97-2	Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester	
Diethylstilbesterol	56-53-1	Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (E)-	1
Dihydrosefrole	94-58-6	1,3-Benzodioxole, 5-propyl-	5
3,4-Dihydroxy-alpha-(methylamino)methyl benzyl alcohol	6912-68-1	1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-	1
Diisopropylfluorophosphate	55-91-4	Phosphorofluoridic acid, bis(1-methylethyl) ester	3

Common Name	CAS RN	Systematic Name	Reason for Change
Dimethoate	60-51-5	Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl]-ester	3
3,3'-Dimethoxybenzidine	119-90-4	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethoxy-	
p-Dimethylaminoazobenzene	60-11-7	Benzenamine, N,N-dimethyl-4-(phenylazo)-	
7,12-Dimethylbenz[<i>a</i>]anthracene	57-97-6	Benz[<i>a</i>]anthracene, 7,12-dimethyl-	
3,3'-Dimethylbenzidine	119-93-7	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethyl-	
Dimethylcarbamoyl chloride	79-44-7	Carbamic chloride, dimethyl-	3
1,1-Dimethylhydrazine	57-14-7	Hydrazine, 1,1-dimethyl-	3,6
1,2-Dimethylhydrazine	540-73-8	Hydrazine, 1,2-dimethyl-	3,6
3,3-Dimethyl-1-(methylthio)-2-butanone, O-[(methylamino) carbonyl]oxime	39196-18-4	2-Butanone, 3,3-dimethyl-1-(methylthio)-, O-[(methylamino)carbonyl]-oxime	5
alpha,alpha-Dimethylphenethylamine	122-09-8	Benzenethanamine, α,α -dimethyl-	
2,4-Dimethylphenol	105-67-9	Phenol, 2,4-dimethyl-	
Dimethyl phthalate	131-11-3	1,2 Benzenedicarboxylic acid, dimethyl ester	
Dimethyl sulfate	77-78-1	Sulfuric acid, dimethyl ester	3
Dinitrobenzene, M.O.S.*			2
4,6-Dinitro o-cresol and salts			2

Common Name	CAS RN	Systematic Name	Reason For Change
2,4-Dinitrophenol	51-28-5	Phenol, 2,4-dinitro-	
2,4-Dinitrotoluene	121-14-2	Benzene, 1-methyl-2,4-dinitro-	
2,6-Dinitrotoluene	606-20-2	Benzene, 2-methyl-1,3-dinitro-	
Di-n-octyl phthalate	117-84-0	1,2-Benzenedicarboxylic acid, dioctyl ester	
1,4-Dioxane	123-91-1	1,4-Dioxane	
Diphenylamine	122-39-4	Benzenamine, N-phenyl-	
1,2-Diphenylhydrazine	122-66-7	Hydrazine, 1,2-diphenyl-	
Di-n-propylnitrosamine	621-64-7	1-Propanamine, N-nitroso-N-propyl-	
Disulfoton	298-04-4	Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl] ester	
2,4-Dithioburet	541-53-7	Thiolimidodicarbonic diamide ((H ₂ N)C(S)) ₂ NH	1
Endosulfan			2
Endrin and metabolites			2
Ethyl carbamate	51-79-6	Carbamic acid, ethyl ester	1
Ethyl cyanide	107-12-0	Propanenitrile	
Ethylenebisdithiocarbamic acid, salts and esters			1,2

Common Name	CAS RN	Systematic Name	Reason For Change
Ethyleneimine	151-56-4	Aziridine	1,3,5
Ethylene oxide	75-21-8	Oxirane	
Ethylenethiourea	96-45-7	2-Imidazolidinethione	1
Ethyl methacrylate	97-63-2	2-Propenoic acid, 2-methyl-, ethyl ester	
Ethyl methanesulfonate	62-50-0	Methanesulfonic acid, ethyl ester	3
Fluoranthene	206-44-0	Fluoranthene	
Fluorine	7782-41-4	Fluorine	3,6
2-Fluoroacetamide	640-19-7	Acetamide, 2-fluoro-	4
Fluoroacetic acid, sodium salt	62-74-8	Acetic acid, fluoro-, sodium salt	6
Formaldehyde	50-00-0	Formaldehyde	6
Formic acid	64-18-6	Formic acid	1
Glycidylaldehyde	765-34-4	Oxiranecarboxaldehyde	3,6
Halomethane, M.O.S.*			2
Heptachlor	76-44-8	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-	
Heptachlor epoxide	1024-57-3	2,5-Methano-2H-indeno[1,2-b]oxirene, 2,3,4,5,6,7,7-heptachloro-1a,1b,5,5a,6,6a-hexahydro-, (1a α ,1b β ,2 α ,5 α ,5a β ,6 β ,6a α)-	

Common Name	CAS RN	Systematic Name	Reason For Change
Hexachlorobenzene	118-76-1	Benzene, hexachloro-	
Hexachlorobutadiene	87-68-3	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	
Hexachlorocyclohexane			2
Hexachlorocyclopentadiene	77-47-4	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	
Hexachlorodibenzo-p-dioxins			
Hexachlorodibenzofurans			
Hexachloroethane	67-72-1	Ethane, hexachloro-	
Isodrin	465-73-6	1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1 α ,4 α ,4a β ,5 β ,8 β ,8a β)-	
Hexachlorophene	70-30-4	Phenol, 2,2'-methylenebis[3,4,6-trichloro-	
Hexachloropropene	1888-71-7	1-Propene, 1,1,2,3,3,3-hexachloro-	
Hexaethyl tetraphosphate	757-58-4	Tetraphosphoric acid, hexaethyl ester	1,3,
Hydrazine	302-01-2	Hydrazine	6
Hydrocyanic acid	74-90-8	Hydrocyanic acid	4
Hydrofluoric acid	7664-39-3	Hydrofluoric acid	4

Common Name	CAS RN	Systematic Name	Reason For Change
Hydrogen sulfide	7783-06-4	Hydrogen sulfide (H ₂ S)	4
Hydroxydimethylarsine oxide	75-60-5	Arsinic acid, dimethyl-	1,7
Indeno(1,2,3-cd)pyrene	193-39-5	Indeno(1,2,3-cd)pyrene	
Iodomethane	74-88-4	Methane, iodo-	
Iron dextran	9004-66-4	Iron dextran	7
Isocyanic acid, methyl ester	624-83-9	Methane, isocyanato-	3
Isobutyl alcohol	78-83-1	1-Propanol, 2-methyl-	
Isosafrole	120-58-1	1,3-Benzodioxole, 5-(1-propenyl)-	
Kepone	143-50-0	1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5a,5b,6-decachlorooctahydro-	
Lasiocarpine	303-34-4	2-Butenoic acid, 2-methyl-, 7-[(2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxymethyl)-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester, [1S-(1R(2),7(2S*,3R*),7aR)]-	1,5
Lead and compounds, N.O.S.*			2
Lead acetate			4
Lead phosphate			4
Lead subacetate	1335-32-6	Lead, bis(acetato-O)tetrahydroxytri-	7
Maleic anhydride	108-31-6	2,5-Furandione	3

Common Name	CAS RN	Systematic Name	Reason for Change
Maleic hydrazide	123-33-1	3,6-Pyridazinedione, 1,2-dihydro-	1
Malononitrile	109-77-3	Propanedinitrile	
Melphalan			1,6
Mercury fulminate	628-86-4	Fulminic acid, mercury(2+) salt	5,7
Mercury and compounds, N.O.S.*			2
Methacrylonitrile	126-98-7	2-Propenenitrile, 2-methyl-	
Methanethiol	74-93-1	Methanethiol	6
Methapyrilene			1
Methomyl	16752-77-5	Ethanimidothioic acid, N-[[[(methylamino)carbonyl]oxy]-, methyl ester	1
Methoxychlor	72-43-5	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis(4-methoxy-	
2-Methylaziridine	75-55-8	Aziridine, 2-methyl-	1
3-Methylcholanthrene	56-49-5	Benz[<i>j</i>]aceanthrylene, 1,2-dihydro-3-methyl-	
Methyl chlorocarbonate	79-22-1	Carbonochloridic acid, methyl ester	
4,4'-Methylenebis(2-chloroaniline)	101-14-4	Benzenamine, 4,4'-methylenebis(2-chloro-	
Methyl ethyl ketone	78-93-3	2-Butanone	
Methyl hydrazine	60-34-4	Hydrazine, methyl-	3,6

Common Name	CAS RN	Systematic Name	Reason For Change
2-Methylactonitrile	75-86-5	Propanenitrile, 2-hydroxy-2-methyl-	3,6
Methyl methacrylate	80-62-6	2-Propenoic acid, 2-methyl-, methyl ester	
Methyl methanesulfonate	66-27-3	Methanesulfonic acid, methyl ester	
Aldicarb	116-06-3	Propanal, 2-methyl-2-(methylthio)-, O-((methylamino)carbonyl)oxime	1
N-Methyl-N'-nitro-N-nitrosoguanidine	70-25-7	Guanidine, N-methyl-N'-nitro-N-nitroso-	1
Methyl parathion	298-00-0	Phosphorothioic acid, O,O-dimethyl O-(4-nitrophenyl) ester	
Methylthiouracil	56-04-2	4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo -	1
Mustard gas	505-60-2	Ethane, 1,1'-thiobis[2-chloro-	3,6
Naphthalene	91-20-3	Naphthalene	
1,4-Naphthoquinone	130-15-4	1,4-Naphthalenedione	
1-Naphthylamine	134-32-7	1-Naphthalenamine	
2-Naphthylamine	91-59-8	2-Naphthalenamine	
1-Naphthyl-2-thiourea	86-88-4	Thiourea, 1-naphthalenyl-	1
Nickel and compounds, N.O.S.*			2
Nickel carbonyl	13463 39-3	Nickel carbonyl (Ni(CO) ₄), (1-4)-	7
Nickel cyanide	557-19-7	Nickel cyanide (Ni(CN) ₂)	4

Common Name	CAS RN	Systematic Name	Reason For Change
Nicotine and salts			1,2
Nitric oxide	10102-43-9	Nitrogen oxide (NO)	3
p-Nitroaniline	100-01-6	Benzenamine, 4-nitro-	
Nitrobenzene	98-95-3	Benzene, nitro-	
Nitrogen dioxide	10102-44-0	Nitrogen oxide (NO ₂)	3
Nitrogen mustard and hydrochloride salt			3
Nitrogen mustard N-Oxide and hydrochloride salt			5
Nitroglycerine	55-63-0	1,2,3-Propanetriol, trinitrate	1
4-Nitrophenol	100-02-7	Phenol, 4-nitro-	
4-Nitroquinoline-1-oxide	56-57-5	Quinoline, 4-nitro-, 1-oxide	1
Nitrosamine, N.O.S.*			2
N-Nitrosodi-n-butylamine	924-16-3	1-Butanamine, N-butyl-N-nitroso-	
N-Nitrosodiethanolamine	1116-54-7	Ethanol, 2,2'-(nitrosoimino)bis-	6
N-Nitrosodiethylamine	55-18-5	Ethanamine, N-ethyl-N-nitroso-	
N-Nitrosodimethylamine	62-75-9	Methanamine, N-methyl-N-nitroso-	

Common Name	CAS RN	Systematic Name	Reason for Change
N-Nitroso-N-ethylurea	759-73-9	Urea, N-methyl-N-nitroso-	1
N-Nitrosomethylethylamine	10595-95-6	Ethanamine, N-methyl-N-nitroso-	
N-Nitroso-N-methylurea	684-93-5	Urea, N-methyl-N-nitroso-	1
N-Nitroso-N-methylurethane	615-53-2	Carbamic acid, methylnitroso-, ethyl ester	6
N-Nitrosomethylvinylamine	4549-40-0	Ethanamine, N-methyl-N-nitroso-	1,5
N-Nitrosomorpholine	59-89-2	Morpholine, 4-nitroso-	
N-Nitrosomonicotinic acid	16543-55-8	Pyridine, 3-(1-nitroso-2-pyrrolidinyl)-, (S)-	5
N-Nitrosopiperidine	100-75-4	Piperidine, 1-nitroso-	2
N-Nitrosopyrrolidine	930-55-2	Pyrrolidine, 1-nitroso-	
N-Nitrososarcosine	13256-22-9	Glycine, N-methyl-N-nitroso-	1,
5-Nitro-o-toluidine	99-55-8	Benzenamine, 2-methyl-5-nitro-	
Octamethylpyrophosphoramide	152-16-9	Diphosphoramide, octamethyl-	1,
Osmium tetroxide	20816-12-0	Osmium oxide (OsO ₄), (T-4)-	4
Endothal			1
Paraldehyde	123-63-7	1,3,5-Trioxane, 2,4,6-trimethyl-	3
Parathion	56-38-2	Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester	

Common Name	CAS RN	Systematic Name	Reason For Change
Pentachlorobenzene	608-93-5	Benzene, pentachloro-	
Pentachlorodibenzo-p-dioxins			
Pentachlorodibenzofurans			
Pentachloroethane	76-01-7	Ethane, pentachloro-	
Pentachloronitrobenzene	82-68-8	Benzene, pentachloronitro-	
Pentachlorophenol	87-86-5	Phenol, pentachloro-	
Phenacetin	62-44-2	Acetamide, N-(4-ethoxyphenyl)-	
Phenol	108-95-2	Phenol	
Phenylenediamine	25265-76-3	Benzenediamine	1
Phenylmercury acetate	62-38-4	Mercury, (acetato-O)phenyl-	7
N-Phenylthiourea	103-85-5	Thiourea, phenyl-	1
Phosgene	75-44-5	Carbonic dichloride	3
Phosphine	7803-51-2	Phosphine	6
Phorate	298-02-2	Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester	
Famphur	52-85-7	Phosphorothioic acid, O-[4-[(dimethylamino)sulfonyl]phenyl] O,O-dimethyl ester	

Common Name	CAS RN	Systematic Name	Reason For Change
Phthalic acid esters, M.O.S.*			2
Phthalic anhydride	85-44-9	1,3-Isobenzofurandione	3
2-Picoline	109-06-8	Pyridine, 2-methyl-	
Polychlorinated biphenyl, M.O.S.*			2
Potassium cyanide	151-50-8	Potassium cyanide (K(C.I))	4
Potassium silver cyanide	506-61-6	Argentate(1-), bis(cynno-C)-, potassium	4
Pronamide	23950-58-5	Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-	
1,3-Propane sultone	1120-71-4	1,2-Oxathiolane, 2,2-dioxide	21,3,
n-Propylamine	107-10-8	1-Propanamine	6
Propylthiouracil	51-52-5	4(1H)-Pyrimidinone, 2,3-dihydro-6-propyl-2-thioxo-	1
2-Propyn-1-ol	107-19-7	2-Propyn-1-ol	
Pyridine	110-86-1	Pyridine	
Reserpine	50-55-5	Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxyl]-, methyl ester, (3 β ,16 β ,17 α ,18 β ,20 α)-	1
Resorcinol	108-46-3	1,3-Benzenediol	
Saccharin and salts			2,6

Common Name	CAS RN	Systematic Name	Reason for Change
Safrole	94-59-7	1,3-Benzodioxole, 5-(2-propenyl)-	
Selenious acid	7783-00-8	Selenious acid (H_2SeO_3)	4
Selenium and compounds, M.O.S.*			2
Selenium sulfide	56093-45-9	Selenium sulfide	4
Selenourea	630-10-4	Selenourea	1,7
Silver and compounds, M.O.S.*			2
Silver cyanide	506-64-9	Silver cyanide ($Ag(CN)$)	4
Sodium cyanide	143-33-9	Sodium cyanide ($Na(CN)$)	4
Streptozotocin	18883-66-4	D-Glucose, 2-deoxy-2-[(methylnitrosoamino)carbonylamino]-	1
Strontium sulfide	1314-96-1	Strontium sulfide (SrS)	4
Strychnine and salts			1,2
1,2,4,5-Tetrachlorobenzene	95-94-3	Benzene, 1,2,4,5-tetrachloro-	
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	Dibenzo[b,e][1,4]dioxin, 2,3,7,8-tetrachloro-	
Tetrachlorodibenzo-p-dioxins			
Tetrachlorodibenzofurans			
Tetrachloroethane, M.O.S.*			2

Common Name	CAS RN	Systematic Name	Reason For Change
1,1,1,2-Tetrachloroethane	630-20-6	Ethane, 1,1,1,2-tetrachloro-	
1,1,2,2-Tetrachloroethane	79-34-5	Ethane, 1,1,2,2-tetrachloro-	
Tetrachloroethene	127-18-4	Ethene, tetrachloro-	
Carbon tetrachloride	56-23-5	Methane, tetrachloro-	
2,3,4,6-Tetrachlorophenol	58-90-2	Phenol, 2,3,4,6-tetrachloro-	
Tetraethyldithiopyrophosphate	3689-24-5	Thiodiphosphoric acid $((\text{HO})_2\text{P}(\text{S})_2)_2\text{O}$, tetraethyl ester	
Tetraethyl lead	78-00-2	Plumbane, tetraethyl-	7
Tetraethylpyrophosphate	107-49-3	Diphosphoric acid, tetraethyl ester	3
Tetranitromethane	509-14-8	Methane, tetranitro-	3
Thallium and compounds, M.O.S.*			2
Thallic oxide	1314-32-5	Thallium oxide (Tl_2O_3)	4
Thallium (I) acetate	563-68-8	Acetic acid, thallium(1+) salt	4
Thallium (I) carbonate	29809-42-5	Carbonic acid, thallium(1+) salt	4
Thallium (I) chloride	7791-12-0	Thallium chloride (TlCl)	4
Thallium (I) nitrate	10102-45-1	Nitric acid, thallium(1+) salt	4
Thallium selenite	12039-52-0	Thallium selenide (TlSe)	4

Common Name	CAS RN	Systematic Name	Reason for Change
Thallium (I) sulfate	7446-18-6	Sulfuric acid, dithallium(1+) salt	4
Thioacetamide	62-55-5	Ethanethioamide	1,3
Thiosemicarbazide	79-19-6	Hydrazinecarbothioamide	1
Thiourea	62-56-6	Thiourea	1
Thiuram	137-26-8	Thioperoxydicarbonic diamide ((H ₂ N)C(S)) ₂ S ₂), tetramethyl-	6
Toluene	108-88-3	Benzene, methyl-	
Toluenediamine			1,2
o-Toluidine hydrochloride	636-21-5	Benzenamine, 2-methyl-, hydrochloride	6
Toluene diisocyanate			3
Toxaphene	8001-35-2	Toxaphene	
Tribromomethane	75-25-2	Methane, tribromo-	
1,2,4-Trichlorobenzene	120-82-1	Benzene, 1,2,4-trichloro-	
1,1,1-Trichloroethane	71-55-6	Ethane, 1,1,1-trichloro-	
1,1,2-Trichloroethane	79-00-5	Ethane, 1,1,2-trichloro-	
Trichloroethene	79-01-6	Ethene, trichloro-	
Trichloromethanethiol	75-70-7	Methanethiol, trichloro-	

Common Name	CAS RN	Systematic Name	Reason For Change
Trichloromonofluoromethane	75-69-4	Methane, trichlorofluoro-	
2,4,5-Trichlorophenol	95-95-4	Phenol, 2,4,5-trichloro-	
2,4,6-Trichlorophenol	88-06-2	Phenol, 2,4,6-trichloro-	
2,4,5-T	93-76-5	Acetic acid, (2,4,5-trichlorophenoxy)-	
Silvex	93-72-1	Propanoic acid, 2-(2,4,5-trichlorophenoxy)-	
Trichloropropane, M.O.S.*			2
1,2,3-Trichloropropane	96-18-4	Propane, 1,2,3-trichloro-	
0,0,0-Triethyl phosphorothioate	126-68-1	Phosphorothioic acid, 0,0,0-triethyl ester	5
sym-Trinitrobenzene	99-35-4	Benzene, 1,3,5-trinitro-	6
Tris(1-aziridinyl) phosphine sulfide	52-24-4	Aziridine, 1,1',1''-phosphinothioylidynetris-	5
Tris(2,3-dibromopropyl) phosphate	126-72-7	1-Propanol, 2,3-dibromo-, phosphate (3:1)	
Trypan blue	72-57-1	2,7-Naphthalenedisulfonic acid, 3,3'-((3,3'-dimethyl(1,1'-biphenyl)-4,4'-diyl)bis(azo))bis(5-amino-4-hydroxy-, tetrasodium salt	1
Uracil mustard	66-75-1	2,4-(1H,3H)-Pyrimidinedione, 5-(bis(2-chloroethyl)amino)-	5
Vanadic acid, ammonium salt			4
Vanadium pentoxide	1314-62-1	Vanadium oxide (V ₂ O ₅)	4

Common Name	CAS RN	Systematic Name	Reason For Change
Vinyl chloride	75-01-4	Ethene, chloro-	
Zinc cyanide	557-21-1	Zinc cyanide ($\text{Zn}(\text{CN})_2$)	4
Zinc phosphide			3